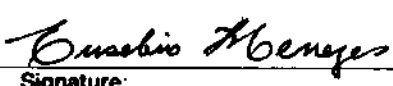
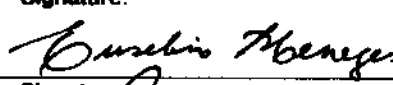
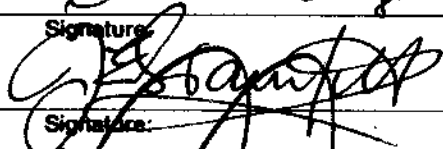



# Raychem Energy Division

# Report

<b>Title</b>		<b>Pages:</b>
TESTING OF HVBT TAPE TO DEMONSTRATE ITS CAPABILITY AS ELECTRICAL INSULATION ON BUSBARS		4
<b>Report Number:</b> EDR-5154		<b>Date:</b> June 4, 1985
<b>Tested by:</b> Eusebio Menezes	<b>Signature:</b> 	<b>Date:</b> June 5 <sup>th</sup> , 1985
<b>Prepared by:</b> Eusebio Menezes	<b>Signature:</b> 	<b>Date:</b> June 5 <sup>th</sup> , 1985
<b>Approved by:</b> John Bramfitt for Technical Operations	<b>Signature:</b> 	<b>Date:</b> 5 <sup>th</sup> June 85.
<b>Approved by:</b> A. R. W. Richardson for Product Management	<b>Signature:</b> 	<b>Date:</b> 5 <sup>th</sup> June '85

Raychem Corporation  
Energy Division

## I. INTRODUCTION

The objective of this report is to demonstrate the capability of the busbar insulating tape HVBT to maintain system voltage when the busbars are either accidentally bridged or grounded. A dry AC withstand test of 15kV for one minute, per ANSI C37.20-1974, was conducted on the HVBT insulated samples.

## II. SUMMARY

Two busbar samples of configurations that are difficult to insulate were tested. The first sample was a 6 x 1/2 inch busbar connected in an elbow at 90 degrees. The other sample was a 4 x 1/4 inch tee configuration. The elbow and the tee were joined using nuts, bolts and washers. The connection was insulated using HVBT-14-A applied with a 2/3 overlap. A wire mesh was then intermittently wound around the HVBT and grounded. High voltage was applied between conductor and ground. Both samples withstood over 3 minutes of 15kV applied voltage. The ANSI specification requires the insulation to withstand 1 minute at 15kV.

### III. CONCLUSION

The test results demonstrate that the HVBT tape will insulate and maintain busbar voltages when accidentally either bridged or grounded by a foreign conductive object. The tape is usable for insulating busbars and busbar connections up to and including 15kV rated voltage.

#### IV. SAMPLE PREPARATION

Two lengths of 6 x 1/2 inch copper busbars were joined using four 1/2 inch nuts, bolts and washers to form a 90 degree elbow connection. The busbars were insulated with BBIT bus tubing except at the end connection overlaps. The 90 degree elbow connection was insulated using HVBT-14-A tape applied with a 2/3 overlap. The installation instructions were followed with the tape overlapping onto the tubing insulation by 2 inches.

To ground the busbar for electrical testing, wire mesh was completely wrapped around the elbow connection and 4 inches onto the BBIT tubing.

The tee sample consisted of two pieces of 4 x 1/4 inch busbar. The tee leg was bolted to the other bus at the middle with four 1/2 inch nuts, bolts and washers. Again, the straight sections of busbar were insulated with bus tubing. The tee connection was insulated using HVBT-14-A tape applied with a 2/3 overlap. The tape was wrapped around the connection and onto the insulation for 2 inches. Wire mesh was completely wrapped around the connection and 4 inches onto the bus tubing.

#### V. TEST

The ANSI C37.20C specification for a 15kV class system requires that the insulation withstand 15kV phase to ground voltage for 1 minute.

Voltage of 15kV, 60HZ was applied to the samples between the copper busbar and the grounded wire mesh. After 3 minutes at 15kV, the test was stopped since the tape had demonstrated its withstand capability.

V. TEST (Continued)

The test geometries selected produced severe electrical stresses far exceeding those associated with conventional flat busbar installations.

The grounded wire mesh extended past the overlaps of the HVBT. No interfacial failures were detected.